

Electricity:

- Background:

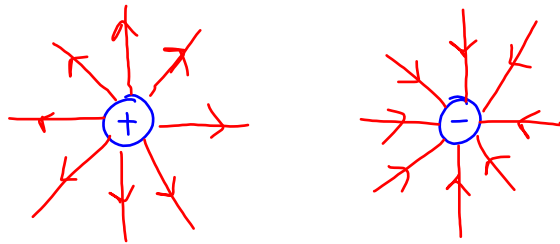
- Atoms made of p^+ , n^0 , and e^-
- Atoms can gain and lose e^- , making charged particles

- Charges

- Caused by an imbalance of number of e^-

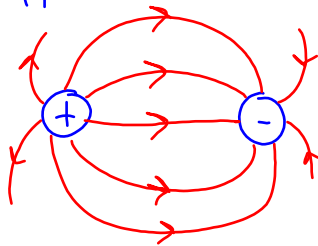
- Charged particles produce an electric field

- Drawing electric fields:

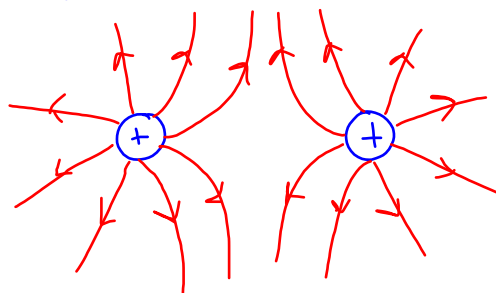


- Drawing two charges:

- Opposite



- Like



- Conservation of Charge:
 - Charge is neither created nor destroyed.
 - Transferred between objects.
 - Happens when electrons are transferred between objects.



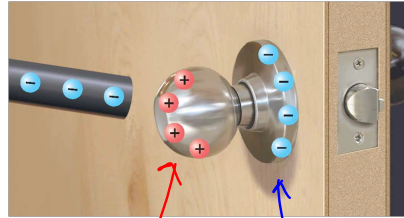
- Transferring Charge:
 - Objects can become charged in three ways:
 1. Induction
 2. Conduction
 3. Friction

1. Induction:

- Transfer charge by bringing a charged object near an uncharged object without touching it.

Total charge of doorknob

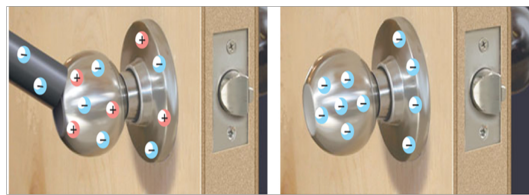
Stays
the same



opposite "charges" are attracted
like charges are repelled

2. Conduction:

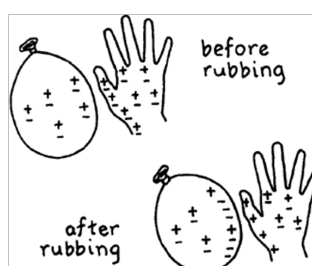
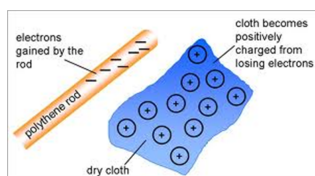
- Electrons are transferred from one object to another by contact



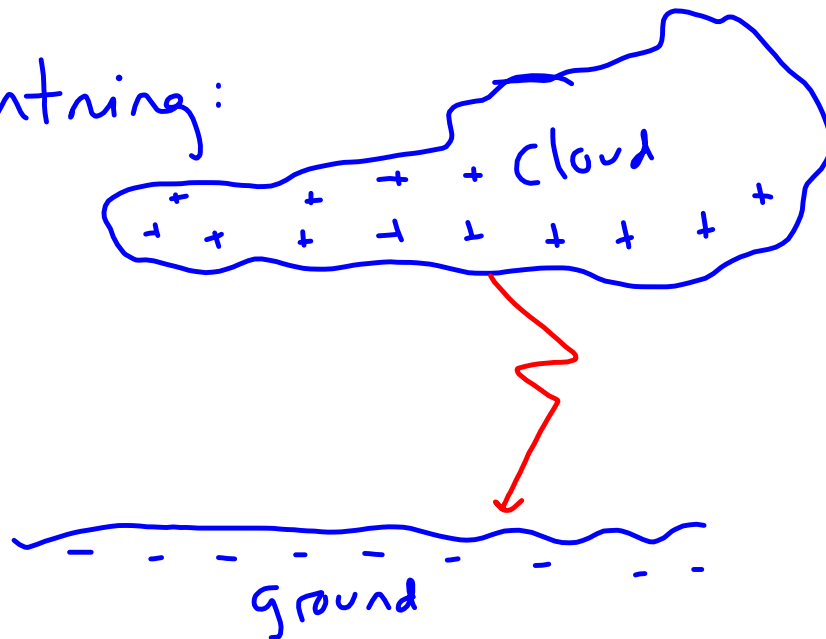
positive charges move to rod,
leaving negatively charged doorknob.

3. Friction:

- Two objects rub against each other, leaving electrons built up on one side.
- Both objects become charged



- Lightning:



- Controlling the Path of Charge:

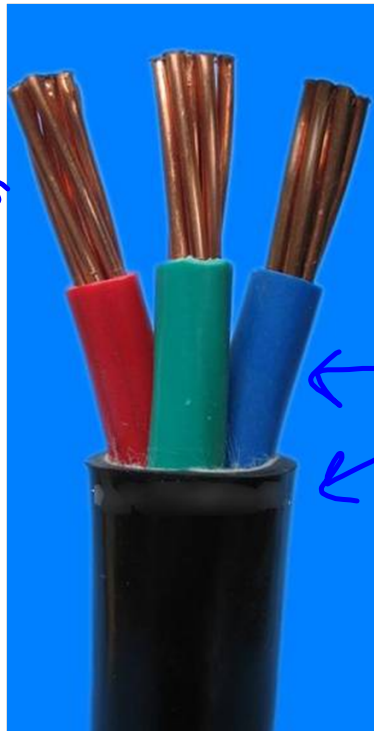
- Electrical Conductors → material in which charges move freely

- Example: anything metal, water, ionic solutions

- Electrical Insulator → material in which electrons do not move freely

- Examples: rubber, styrofoam, air, wood

in wire,
 e^- move
very easily



electrons
are very difficult
to move



↑ uncontrolled flow of electricity

- Electricity → flow of electric current

- Electric current → movement of electric charge

- Ohm's Law:

- Relationship between voltage, current, and resistance.

- Equation: $V = IR$

Voltage (V) → Volts (V)

Current (I) → Amperes (A)
"Amps"

Resistance (R) → Ohms (Ω)